

Andean 'lost grains' in Bolivia and Peru

This initiative involving 80 partners, **enhanced the livelihoods** of the rural poor—including increasing incomes, marketing opportunities, self-esteem and women's empowerment—through the use of **neglected and underutilized species**.

Bioversity International's series of Impact Assessment Briefs aims to inform readers about the major results of evaluations carried out by the centre. The Briefs summarize conclusions and methods of more formal papers published in peer-reviewed journals.

Grown by the ancient civilizations of the Andes, grains such as quinoa, cañihua and amaranth have been staple crops for communities across Bolivia and Peru for over a millennia.

Agricultural practices have changed dramatically over the last decade, and poor rural farmers are cultivating these traditional varieties less due to their poor economic competitiveness with global cereal crops, lack of improved varieties, arduous cultivation practices, difficulty of processing, lack of access to market chains and the negative image often associated with Andean grains as 'food for the poor'.

More recently, less nutritious, convenience foods—made of wheat, rice and maize—have rapidly replaced these ancient grains. To reverse the trend of these 'neglected and underutilized species' (NUS), falling into disuse, a global effort commenced in 2001 coordinated by Bioversity International.



The project

This project emerged from more than 10 years of international work by Bioversity International on neglected and underutilized species (NUS). They concluded that in order to improve livelihoods for the rural poor, development projects should not be limited to a single focus, such as conservation, but set within a livelihood framework. The approach should instead be holistic, and one that incorporates diverse sectors of society and encourages close collaborations.

This project was implemented in two phases. Phase I (2001-2005), set out to increase both demand for, and use of, Andean grains, through the development of improved processing technologies, and better marketing. Phase II (2007-2010), consolidated the outcomes of the first phase further supporting the use of Andean grains specifically for improving livelihoods.

Above: Bolivian farmers on the shore of Lake Titicaca, examine quinoa seed heads with an extension worker (pictured left) from PROINPA.



Science for a food secure future

Bioversity International is a member of the CGIAR Consortium. CGIAR is a global research partnership for a food secure future.

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The stakeholders exceeded more than 80 groups with expertise covering conservation, ecotourism, nutritional analysis, food quality assurance, marketing and media

Above: Bolivian rural landscape (photo credit: Alfredo Camacho).

The partners

Bioversity coordinated the project at the global level, while development agencies from Bolivia (PROINPA) and Peru (CIRNMA) provided local coordination. Project stakeholders exceeded more than 80 groups with expertise covering conservation, ecotourism, nutritional analysis, food quality assurance, marketing and media with core partners from NGOs, universities, research institutes, public sector, private enterprises, government, extension workers and women's groups.

Methodology

Project assessment relied on both qualitative and quantitative data analysis. A particular focus was placed on Social Network Analysis in order to map and understand the quality of linkages (or relationships) occurring between different project actors, to demonstrate paths of communication and how this affected project outcomes. Quantitative analysis compared different participation scenarios—participation in Phase I only, or Phase II only, or in both phases—to analyze whether involvement in different phases enhanced livelihoods.

Results

This project emphasized partnerships, which were developed through the use of Social Network Analysis, illustrating how a solid and cohesive network of actors can deliver better results. A sample of 960 farmers were analyzed.

RESULTS: CULTIVATION AND PROCESSING

Obstacles hindering the cultivation of Andean grains are often found post-harvest. Arduous tasks, such as removing the bitter, unpalatable saponin coating from quinoa—which can take women up to 6 hours a day—or removing grit from the harvest, all hinder cultivation.

Working in close collaboration with farmers, more efficient, practical and safer innovations were developed, with an emphasis on combining traditional and modern cultivation and processing methods.

Example outputs

- Two threshing machines were designed and built by the community reducing processing time from 2 hours to 7 minutes
- Equipment developed to remove saponin, replacing the hours of drudgery often spent by women
- A continuous popping machine was developed, increasing the quantity of amaranth processed
- Lead-free lid found for popping machine, eliminating contamination and increasing food safety
- A technological solution was found for reducing grain loss during the harvest of amaranth in Peru
- Pests and diseases were surveyed for the first time in Bolivia
- Two manuals on cultivation practices and pest and disease management were produced and distributed to farmers
- Indigenous knowledge on cultivation methods documented.

KEY FIGURES

- Production of Andean grains increased by **45%** in Peru (after Phase I) and by **140%** in Bolivia (after both Phases).
- Land under amaranth cultivation grew from **8 ha** in 2005, to **50 ha** in 2009.



Left: Bolivian farmers threshing quinoa;

centre: a Peruvian farmer harvesting quinoa;

below: a Peruvian farmer demonstrating the varieties of quinoa varieties available.

70 percent of people interviewed were unaware of the nutritional benefits of Andean grains



RESULTS: VARIETIES

Traditional varieties of Andean grains are under threat of genetic erosion. Through the organization of biodiversity fairs, seed samples were taken to genebanks to stem the loss of local varieties.

Additionally, the current lack of high yielding, and pest and disease resistant varieties, often hamper the cultivation of Andean grains. Trained farmers and their associations worked together to develop and distribute improved varieties of seeds of high quality.

Example outputs

- Several hundred seed evaluation trials were carried out between 2001–2010
- Six improved varieties were distributed to communities across Bolivia and Peru
- A saponin-free quinoa variety was developed and distributed in Peru
- A descriptor list for the genetic resources of cañihua was developed
- Biodiversity fairs organised for the documentation of seeds and exchange of knowledge.

RESULTS: CONSUMPTION

Many underutilized grains can make an important contribution to the diet of poor rural communities. For example, quinoa, cañihua and amaranth, all contain higher amounts of essential amino acids than wheat.

Laboratory analysis and surveys documented the grains nutritional content. Based on these findings the teams were able to promote the most nutritional varieties—especially for children and pregnant women—and to develop highly nutritious recipes.

Knowledge of traditional uses of Andean grains was also gathered through discussion and focus groups to safeguard the diversity of local recipes.

Example outputs

- Literature compiled on nutritional information
- Training courses organized on nutrition and food preparation
- Food tasting trials organized by communities
- Indigenous knowledge of recipes and food preparation documented.

KEY FIGURES

- Traditional Andean grains cultivated increased—up by **122%** in Bolivia, and by **56%** in Peru (after both Phases).
- New varieties cultivated increased—up by **132%** in Bolivia, and by **69%** in Peru (after both phases).

KEY FIGURES

- Consumption of Andean grains increased by **13%** in Bolivia and **44%** in Peru for those who participated in both project phases.



Above: Bolivian farmer in her quinoa field (credit: S. Padulosi).

RESULTS: MARKETING

Removing the 'food for the poor' stigma is fundamental for the future growth of Andean grains, and attention was given to popularizing them via radio, television and newspapers.

An alliance was developed with high-street coffee chain, Alexander Coffee, to showcase the attractive range and diversity of Andean products available to the public.

To stimulate national and international markets, quality standards are integral. The first of their kind were developed in the Andean region removing potential export barriers.

Example outputs

- Campaigns launched in coffee-shop chain with ecotourism organization
- Quality and technical standards developed for cañihua and quinoa.

KEY FIGURES

- Marketing opportunities increased by **81%** in Bolivia and by **64%** in Peru (after both Phases).

RESULTS: CAPACITY BUILDING

Capacity building was integral and hundreds of beneficiaries were reached each year—from the training of farmer groups and university students, to raising awareness of the nutritional role to both the public and rural farming communities.

Improving grain processing technologies has enhanced the capacity of women, allowing them extra time to earn alternative incomes and improving their social status.

Important exit strategies implemented included the development of farmers' cooperatives and the establishment of platforms of collaboration between NGOs, private and public sectors on each target species.

Example outputs

- In 2009 alone, 94 farmers were trained in grain cultivation and nutrition
- 30 highly participative workshops aimed at producer organizations covering all aspects of grain production were held during one year.

Related Reading

- PADULOSI S. 2007. *Neglected No More: Achievements of the IFAD-NUS Project (2001-2005) and Framework for its Follow-up Initiative (2007-2009)*.
- PADULOSI S. AND I. HOESCHLE-ZELEDON. 2004. *Underutilized Plant Species: What Are They?*

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KEY RECOMMENDATIONS

Holistic approach: A multi-stakeholder, multi-disciplinary and participatory approach is crucial to enhance the use of neglected and underutilized species. The Social Network Analysis illustrated how a solid and cohesive network of actors can deliver better results.

Empowering women: Owing to the central role of women in the cultivation and use of Andean grains in their everyday life, enhancing women's capacity in farming, marketing and cooking is crucial.

Private sector involvement: The involvement of the private sector and communities is crucial to ensure that the project deliverables are not only scaled out at the community level, but also scaled in by the private sectors and eventually institutionalized by governments.

Removing stigmas: Whereas better varieties and technologies contribute towards making neglected and underutilized species economically more competitive, this project has shown that any increase in demand for such species and products can only be achieved once the 'food for the poor' stigma is removed.

Both phase participation: The most visible and evident impacts were observed in those households participating in both phases of the project. To determine these impacts, however, there needs to be sufficient time from the beginning of the project to the start of the survey to observe the accrual of livelihood benefits on the participants.

Policy making: Policies to develop standards in processing or promoting the inclusion of nutritious neglected and underutilized species are highly relevant.